ABSTRACT

A hybrid protein (lacZ-TTC) encoded by a gene fusion between lacZ and the non-toxic proteolytic C fragment of tetanus toxin (TTC) retains the biological functions of both proteins *in vivo*, i.e., retrograde transynaptic transport of the TTC fragment and β–galactosidase enzymatic activity. After intramuscular injection, β-galactosidase activity could be detected in motoneurons and connected neurons of the brainstem areas, demonstrating that the TTC fragment mediates both *in vivo* axonal retrograde transport and transynaptic transport. This strategy is useful for the delivery of a biological activity to neurons from the periphery to the central nervous system. Such a hybrid protein can also be used to map synaptic connections between neural cells.

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